

AEROSPACE & MECHANICAL ENGINEERING



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INFORMAL COFFEE PERIOD BEFORE THE SEMINAR IN ROOM 365, ENGR. BLDG.
UNIVERSITY OF NOTRE DAME, NOTRE DAME, INDIANA 46556

SPEAKER: **Dr. Arezoo Ardekani**
Department of Mechanical Engineering
Massachusetts Institute of Technology
Cambridge, Massachusetts

TOPIC: **THEORY, COMPUTATION, AND EXPERIMENTS OF
MULTIPHASE FLOWS: JETS, PARTICLES, AND DROPS**

DATE: Tuesday, February 23, 2010

TIME: 3:30 p.m.

PLACE: 138 DeBartolo Hall

ABSTRACT

Understanding the instability and breakup of polymeric jets is important for a wide variety of applications including inkjet printing and spraying of fertilizers and paint. Such fluids are typically only weakly viscoelastic and the jetting/breakup process involves a delicate interplay of capillary, viscous, inertial and elastic stresses. I show that by understanding the physical processes that control different phases of the temporal evolution in the jet profile, it is possible to extract transient extensional viscosity information even for very low viscosity and weakly-elastic liquids. This is especially useful since filament-stretching and capillary breakup elongational rheometers face challenges for low-viscosity elastic polymer solutions. I shall also discuss extensional flows generated due to collision of particles in multiphase flows. The motion of solid particles in a fluid plays an important role in many natural and industrial applications such as sedimentation, crystal growth, suspension rheology, and microfluidic devices. To accurately predict the behavior of particulate flows, fundamental knowledge of the mechanisms of single collision is required. I will present the influence of the Newtonian and viscoelastic fluids on the collision process.

NOTE: *If you are interested in meeting individually with
Dr. Ardekani, please contact Evelyn at 631-5431*